

REMARKS

Applicant respectfully requests examination of the present application in view of the foregoing amendments.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

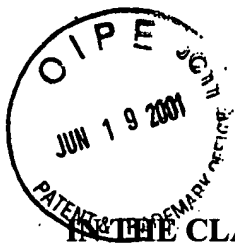
Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS

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3. (Amended) A system for wireless networking, comprising:

[providing] a remote terminal unit;

means for creating a transmission protocol with an Internet Protocol for the remote terminal unit; and

means for sending the created protocol.

5. (Added) A system for wireless networking to communicate with remote terminals, comprising:

a protocol conversion module for converting time discrete input information to information formatted for sending to remote terminals in data packets;

a router module for internally routing said data packets;

said protocol conversion module for converting the time discrete input information into an Internet Protocol base protocol;

a wireless protocol module for creating links to the remote terminals;

a wireless device interface module for providing wireless transceiver interfacing; and

at least one transceiver for responding to said interface module for sending information wirelessly to remote terminals.

6. (Added) A system according to claim 1, wherein said protocol conversion module converts the instrumentation time discrete information in an IP * GAS1d protocol.

7. (Added) A method for wirelessly networking to communicate with remote terminals, comprising:

converting time discrete input information to information formatted for sending to remote

terminals in data packets;

internally routing said data packets;

converting the time discrete input information into Internet Protocol base protocol;

creating links wirelessly to the remote terminals;

interfacing the links; and

sending information wirelessly to remote terminals via said links.



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TITLE OF THE INVENTION

METHOD AND APPARATUS FOR WIRELESS NETWORKING

CROSS-REFERENCE TO RELATED APPLICATIONS

Not Applicable

5 STATEMENT REGARDING FEDERALLY SPONSORED
RESEARCH OR DEVELOPMENT

Not Applicable

REFERENCE TO A "MICROFICHE APPENDIX"

Not Applicable

10 BACKGROUND OF THE INVENTION

Technical Field

The present invention relates in general to a method and apparatus for wireless networking. The invention more particularly relates to wireless networking router systems for facilitating communications via wireless transmission, in a more efficient and reliable manner.

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Background Art

In industrial automation it becomes necessary to gather information from several remote sites and use that information to control operations at the remote sites. The data is gathered by using various types of transducers that measure the physical variables (such as temperature, revolutions per minute, etc.) and convert them into electrical signals. Similarly the remote equipment can be controlled by using mechanisms that

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Recently some RTUs have begun to use the Internet Protocol (IP) using ethernet communications. Using IP protocol allows having a router on the same ethernet. An IP router, such as the one marketed under the tradename "MAVRIC" by Metric Systems Corp., of Carlsbad, California, can allow access to wireless transmission of the data
5 across a network of arbitrary topology, by interconnecting ethernet or other inputs to the flexibility of the topology offered by IP routing allows placement of radios wherever they are needed for connectivity. The combination of an RTU using IP on an ethernet channel and an IP router on the same ethernet channel solves all the topological problems of using wireless communications for data acquisition and control.

10 While such a system has proven highly successful, it would be desirable to have a more band width utilization efficient system to operate at a variety of different bands.

SUMMARY OF THE INVENTION

The principal object of the present invention is to provide a new and improved
15 method and apparatus for facilitating wireless networking.

Another object of the present invention is to provide such a new and improved method and apparatus which are more band width utilization efficient.

Briefly, the above and further objects of the invention are realized by providing an improved technique for greatly improving the band width utilization efficiency.

20 A method and apparatus for wireless networking employs a wireless protocol module and a wireless device interface module for controlling a remote terminal unit,

whereby the modules integrate the remote terminal unit software and wireless networking application software.

BRIEF DESCRIPTION OF DRAWINGS

The above mentioned and other objects and features of this invention and the manner of attaining them will become apparent, and the invention itself will be best understood by reference to the following description of the embodiment of the invention in conjunction with the accompanying drawings, wherein:

FIG. 1 - 46, illustrate the method and apparatus of the present invention.

BEST MODE FOR CARRYING OUT THE INVENTION

Referring now to the drawings, and more particularly to FIG.1 thereof, there is shown a wireless internetworking Embedded RTU/PLC system 10, which is constructed in accordance with the present invention. The system 10 sensor device input modules 12 which respond to a variety of inputs such as a analog or digital input 14, an asynchronous input 16 as well as other possible inputs.

The system also includes a device Protocol conversion Module 21 which converts the instrumentation time discrete information in an IP* GAS1d Protocol that can be routed and serviced by the embedded router.

The system 10 also includes a level 3 router module 18, which internally routes data packets. The protocol conversion module 21 converts the time discrete information into an Internet Protocol (IP) base protocol. A wireless protocol module 22 creates reliable links to multiple users within the radio range of each transceiver. A wireless

device interface module 23 provides interface requirements for a given radio transceiver generally indicated at 27.

The following is a table explaining the function of the system modules:

5	Basic System Operation: Module RTU/PLC Input device	Function Converts Physical and virtual parameters datagrams that are bi-directional transferred to the protocol conversion module.
10	Protocol Conversion module	Converts the Instrumentation time discrete information into an IP base protocol that can be routed and serviced by the embedded IP router.
15	Level 3 Internet protocol Router	Internally routes the instrumentation data packets to the appropriate wireless cell also maintains internal network map of all connecting links.
20	Wireless protocol Module	This module manages five functions required to create reliable links to multiple users within the radio range of each attached transceiver:
25	Wireless Device Interface Module	Provides the specific physical interface requirements to support various types of wireless radios and physical interfaces; i.e. RS-232/Ethernet/RS-530/ etc.

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When the system 10 is shown and described as being preferably useful in connection with control and monitor functions in an industrial automation process, the system of the present invention can also be used for a variety of different applications,

whereby the modules integrate the remote terminal unit software and wireless networking application software.

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The above mentioned and other objects and features of this invention and the
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connection with control and monitor functions in an industrial automation process, the system of the present invention can also be used for a variety of different applications,